What is claimed is:

1. A method for determining occupancy of a space, comprising:

defining a reference plane in the space using at least one optically generated fan light beam;

determining whether an object intersects the plane at an intersection, including interpreting an output of an optical imaging sensor placed in a known vertical position relative to the plane, and having a field of view that substantially coincides with the plane, wherein the object is in the field of view; and

calculating a shape of the intersection, a size of the intersection, and a relative location of the intersection in the space.

2. The method of claim 1, wherein the fan light beam has a spectrum in one of a group of spectra comprising visible spectra and invisible spectra.

3. The method of claim 1, wherein defining the reference plane includes using a rotating light source selected form a group comprising a laser and a light emitting diode.

4. The method of claim 1, wherein the optically generated fan light beam includes a scanning light beam.

5. The method of claim 1, the optically generated fan light beam includes multiple light sources selected from a group comprising lasers and light emitting diodes.

6. The method of claim 1, wherein the reference plane is generated by a light source selected from a group comprising lasers and light emitting diodes.

7. The method of claim 1, wherein the reference plane is selected form a group comprising the ground, the floor of a building, the floor of a room, and the floor of a compartment.

8. The method of claims 1, wherein the imaging sensor is selected from a group comprising a digital camera with a field of view, and a light sensitivity images the intersection pattern.

9. The method of claims 1, wherein a vertical distance of the imaging sensor from the reference plane is determined considering the size of the smallest object that must be detected by the sensor.

10. The method of claim 1, wherein determining includes:

taking a reference training image of the intersection;

taking another image of the space;

processing differences between the training image and the other image, including differences in intersection patterns in respective images;

if it is determined that an object intersects the plane at an intersection, estimating a size of the object and estimating a location of the object.

11. A method for detecting the presence of objects in a region of interest, comprising:

using a single-sensor 3D camera device with a field of view that substantially coincides with the region of the interest for detecting occupancy;

using image processing algorithms to detect objects closest to the 3D camera device;

using image processing algorithms to calculate a volume in front of the closest objects and a volume behind the closest objects.

12. The method of claims 11, wherein the 3D camera device uses a sensing technique chosen from a group comprising:

a time-of-flight method;

a depth-of-focus method;

a structured-light method; and

a triangulation method.

13. A system for detecting the presence of objects in a space, comprising:

at least one light source for generating an optical reference plane;

at least one camera device in a known vertical position relative to the reference plane and having a field of view that substantially coincides with the reference plane; and

an image processing system configured to process images produced by the camera for detecting the intersection of an object in the field of view intersects the reference plane.

14. A system for detecting an object in a space, comprising:

at least one sensor device that takes an image of the space, wherein an image comprises an instance of light recorded on a medium;

a means for defining a reference plane; and means for determining whether the object intersects the plane at an intersection, wherein determining includes comparing different images of the space.

15. The system of claim 14, wherein the means for defining includes at least one of a physical surface and at least one light beam.

16. The system of claim 14, wherein the sensor device is selected from a group comprising a digital camera, and a 3D range sensor.

17. The system of claim 14, further comprising means for processing the different images of the space to determine whether the space is empty.

18. The system of claim 17, further comprising means for processing the different images of the space to calculate a full-ness factor for the space when the space is determined to be non-empty.

19. The system of claim 17, further comprising means for processing the different images of the space to calculate a full-ness factor for the space when the space is determined to be non-empty.

20. The system of claim 17, further comprising means for processing the different images of the space to calculate an object in the space when the space is determined to be non-empty.